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SIMILARITY AS METRIC TRANSFORMATIONS IN EUCLIDEAN GEOMETRY

The art of delineating objects has been attracting people since the ancient times. Attempts of such depictions appeared much earlier than writing . Even in ancient times people were drawing various designs of household objects, plants and animals on the rocks, walls and vessels . The rules of proper object depicting were understood in the process of practical experience. So, the beginnings of compliance and transformation doctrine appeared. The doctrine of similar figures existed in ancient Greece. In particular, Euclid wrote about transforming similarity in the book " The Beginning".

Scientific development of transformation theory, which provides accurate depiction of objects with proper sizes, was demanded by increasing technical progress . The problem was solved by efforts of many talented people. Great contribution to the study was made by German Mobius (1746-1818). Later F. Klein (1849-1927) took various transformations into classification of different geometries.

The Latin letter S – the first letter in the word «*similes*», which means "*similarity*" is the symbol that indicates the similarity of figures. The process of transformation of one figure into another, when the distance between the points is changing by the same number of times is called the *conversion similarity*. This number is called *similarity coefficient* which is indicated by Latin letter “k” and is a positive number.

If the similarity is equal to one – the similarity factor is *movement*; If it is smaller than one the distance between the points is reducing; if the coefficient is greater than one, the distance between the points is increasing.

Two figures are called similar if one of them can be obtained from the second through similarity transformation. The similarity of the figures means that irrespective of the size and position on the surface these figures have the same shape.

All circles are similar figures, all squares are similar figures.

If the first figure is like the second figure by a factor k, the second figure is also similar to the first figure, but with a coefficient inversed to number k, – 1 / k. *Homothetic transformation* is one of the similarity transformations.

Homothetic transformation is possible if two similar figures are placed in such a way that all the beams drawn, through the points of one figure, pass through the corresponding points of the second figure.

Geometric transformation is used to prove theorems and for solving various problems as well.

The idea of transformations is one of the main ones in modern mathematical science and in different sectors of its usage. It is closely related to the ideas of functions, mappings, which are widely used in practice (architecture, surveying, etc.).

In addition, geometric transformation is a good tool for proving theorem and solving problems.

The aim of our further reseach is the study of practical usage of similarity.

LITERATURE

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